FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

23 February to 1 March, 2014 (Week 09)

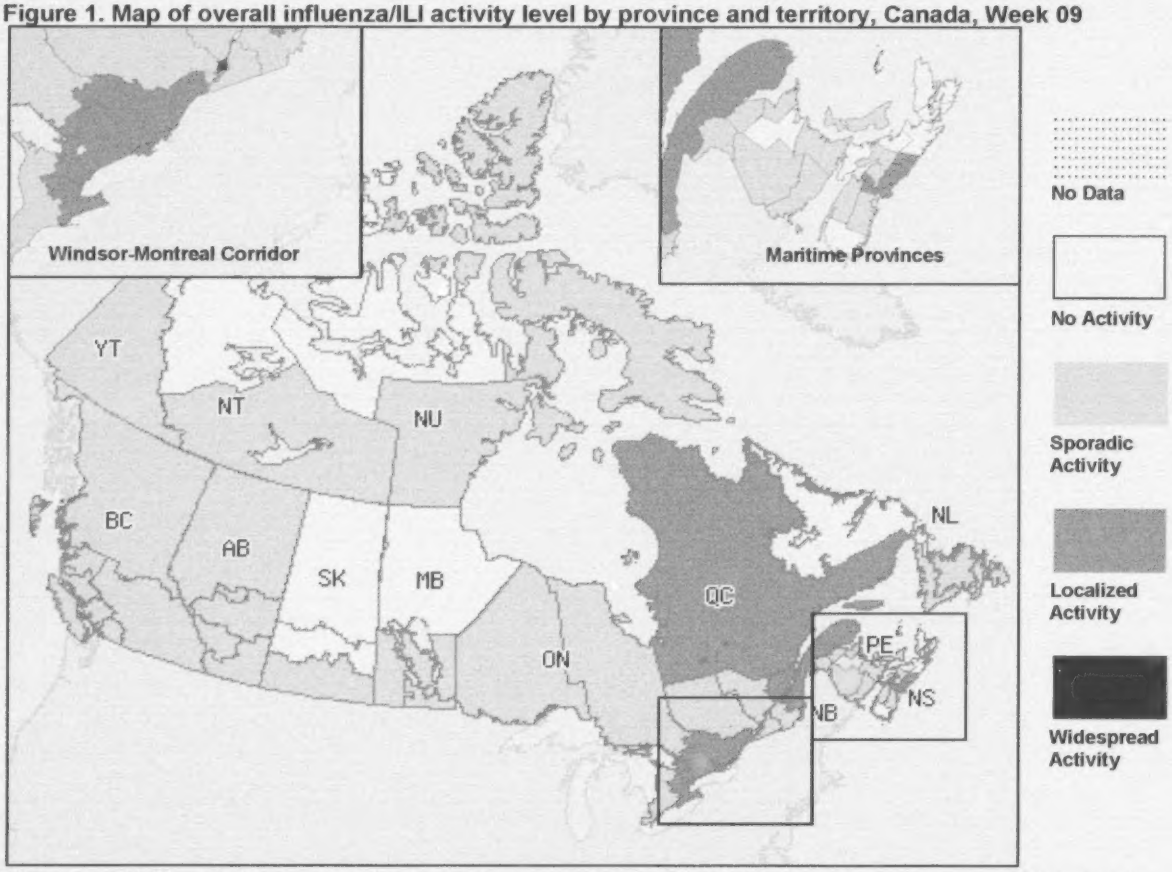
Overall Summary

- In week 09, influenza activity in Canada continues to decrease, following a pattern similar to the 2012-13 season.
- The influenza A(H1N1) virus remains the most common influenza virus circulating this season, affecting a greater proportion of adults 20-64 years of age compared to last season.
- Circulation of influenza B virus continues to increase.
- The number of sentinel paediatric and adult hospitalizations continues to decline. To week 09, 3,238 hospitalizations and 182 deaths have been reported. Compared to the same period last season, fewer hospitalizations but a similar number of deaths have been reported.
- A Canadian vaccine effectiveness study has estimated that immunization with the 2013-14 seasonal influenza vaccine has been 58.5% effective in reducing influenza-related hospitalizations (McNeil S, Shinde V, Andrew M *et al.*).

Influenza/ILI Activity (geographic spread)

In week 09, influenza activity levels continued to decline. One region in Quebec reported widespread activity and seven regions in eastern Canada (ON(4), QC(2) and NS(1)) reported localized activity (Figure 1).

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 09

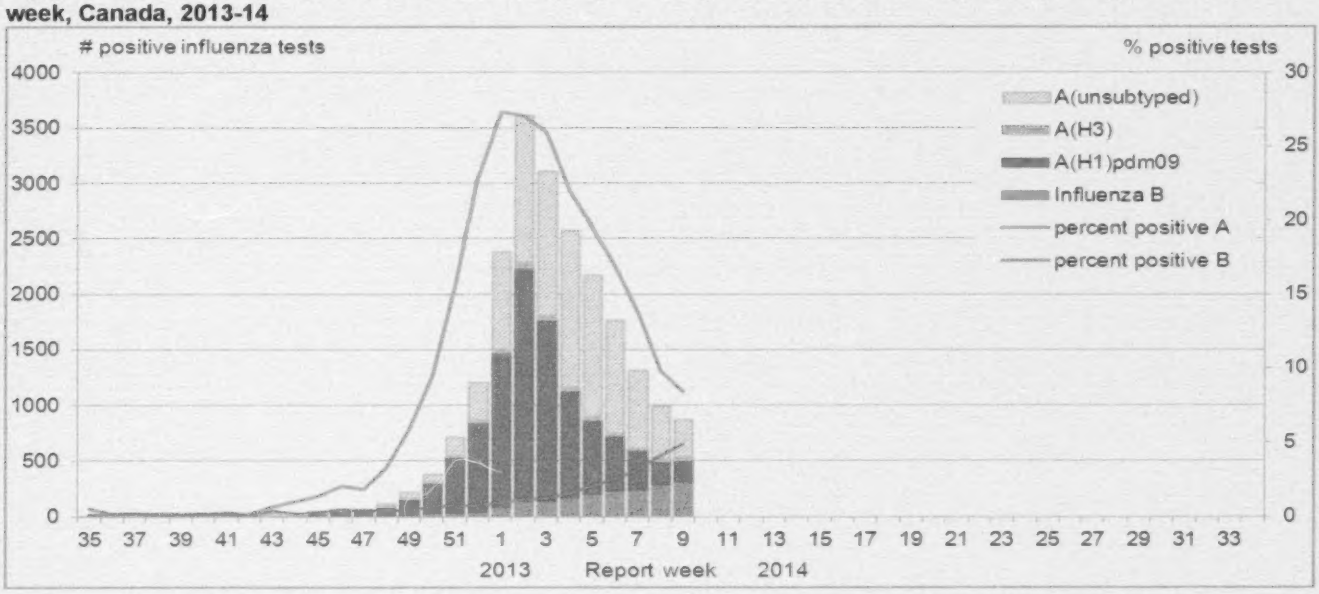


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

The number of positive influenza tests continued to decrease, from 985 in week 08 to 864 in week 09. The percentage of positive influenza tests decreased from 13.9% to 13.3% (Figure 2). Cumulative influenza virus detections to date remain predominantly influenza A (91%), and among those subtyped, 97% (9,933/10,290) were A(H1N1)pdm09. However, the percentage of positive tests for influenza B has been rising slowly in recent weeks to 36.7% of influenza detections in week 09 (Table 1). Among the 17,709 cases for which information on age and type/subtype has been received this season, 55.8% were 20-64 years of age (Table 2).

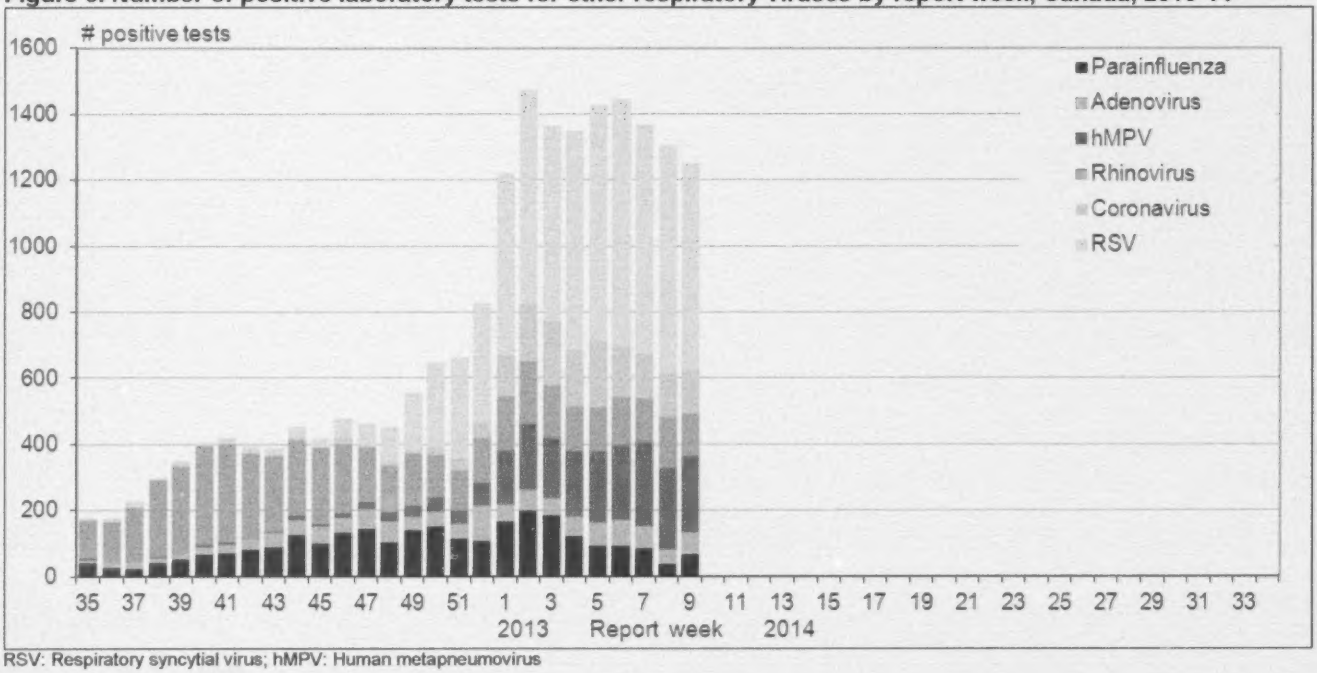
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2013-14



The number of positive tests for RSV declined slightly in week 09. The number of positive tests for parainfluenza increased slightly in week 09, interrupting the decline observed since early January. The number of positive tests for rhinovirus has been relatively stable, while the number of positive tests for coronavirus and human metapneumovirus has been declining over recent weeks (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2013-14



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2013-14

Reporting provinces[1]	Weekly (February 23 to March 1, 2014)					Cumulative (August 25, 2013 to March 1, 2014)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	73	50	13	10	20	1731	1573	58	100	98
AB	43	16	1	26	15	3585	3297	44	244	105
SK	15	12	0	3	3	1332	962	4	366	27
MB	34	29	0	5	0	572	407	1	164	15
ON	105	32	12	61	94	5352	2341	242	2769	395
QC	214	35	0	179	174	5021	651	3	4367	1212
NB	37	2	0	35	2	1455	366	1	1088	12
NS	17	15	0	2	1	146	117	4	25	2
PE	1	1	0	0	0	116	115	0	1	0
NL	8	0	0	8	8	332	104	0	228	131
Canada	**547**	**192**	**26**	**329**	**317**	**19642**	**9933**	**357**	**9352**	**1997**
Percentage[2]	63.3%	35.1%	4.8%	60.1%	36.7%	90.8%	50.6%	1.8%	47.6%	9.2%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2013-14

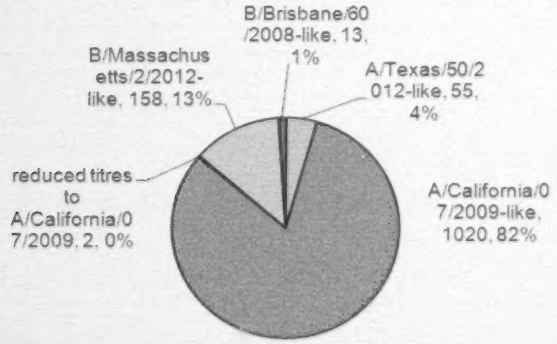
Age groups (years)	Weekly (February 23 to March 1, 2014)					Cumulative (August 25, 2013 to March 1, 2014)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	67	16	0	51	28	3034	1358	23	1653	212	3246	18.3%
5-19	19	4	0	15	37	1246	669	18	559	317	1563	8.8%
20-44	74	22	0	52	39	4843	2644	33	2166	361	5204	29.4%
45-64	76	28	1	47	47	4217	2269	40	1908	453	4670	26.4%
65+	57	17	3	37	63	2292	936	95	1261	602	2894	16.3%
Unknown	4	1	3	0	0	130	100	17	13	2	132	0.7%
Total	297	88	7	202	214	15762	7976	226	7560	1947	17709	100.0%
Percentage[2]	58.1%	29.6%	2.4%	68.0%	41.9%	89.0%	50.6%	1.4%	48.0%	11.0%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Influenza Strain Characterizations

During the 2013-2014 influenza season, the National Microbiology Laboratory (NML) has antigenically characterized 1248 influenza viruses [55 A(H3N2), 1022 A(H1N1)pdm09 and 171 influenza B]. The vast majority (99%) of viruses were similar to the strains recommended by the WHO for the 2013-14 seasonal influenza vaccine. Two A(H1N1)pdm09 viruses showed reduced titres to antiserum against the reference A/California/07/2009 strain. Thirteen influenza B viruses were similar to the strain recommended by the WHO for the 2011-12 vaccine (Figure 4).

Figure 4. Influenza strain characterizations, Canada, 2013-14, N = 1248



The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2013-2014 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A(H3N2) virus antigenically like the cell-propagated prototype virus A/Victoria/361/2011b (e.g. A/Texas/50/2012), and a B/Massachusetts/2/2012-like virus (Yamagata lineage).

Antiviral Resistance

During the 2013-2014 influenza season, NML has tested 883 influenza viruses for resistance to oseltamivir and all but two were sensitive. All 882 viruses tested for resistance to zanamivir were sensitive. All 1104 influenza A viruses tested for amantadine resistance were resistant (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2013-14

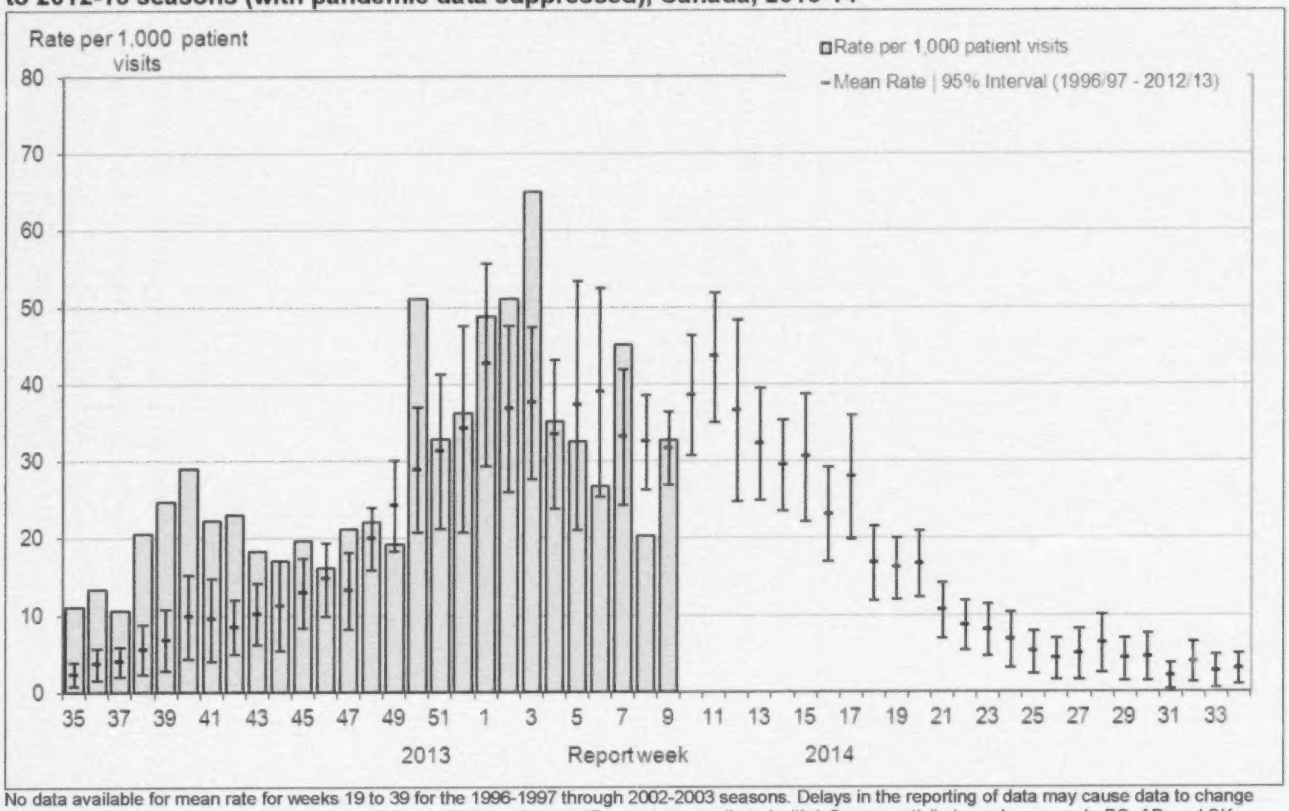
Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	48	0	48	0	76	76 (100%)
A (H1N1)	742	2 (0.3%)	741	0	1028	1028 (100%)
B	93	0	93	0	NA[1]	NA[1]
TOTAL	883	2 (0.2%)	882	0	1104	1104 (100%)

[1] NA – not applicable

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation rate increased from 20.3/1,000 in week 08 to 32.7/1,000 in week 09; which is within the expected range for week 09 (Figure 5).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2013-14

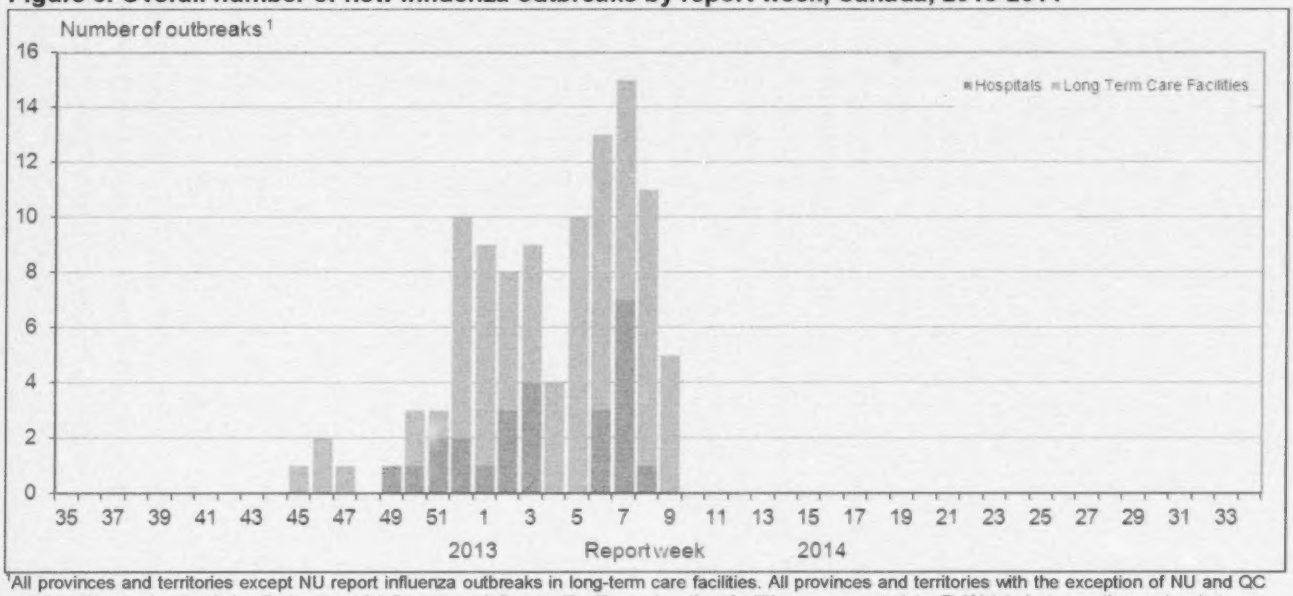


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. The number of sentinel physicians in each province or territory is as follows: BC(21), AB(80), SK(11), MB(18), ON(169), QC(14), NB(29), NS(26), PE(4), NL(16), NU(1), NT(14), YT(13). Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 09, five new influenza outbreaks in long-term care facilities were reported (Figure 6). In addition, one outbreak of influenza-like-illness was reported in a school.

Figure 6. Overall number of new influenza outbreaks by report week, Canada, 2013-2014

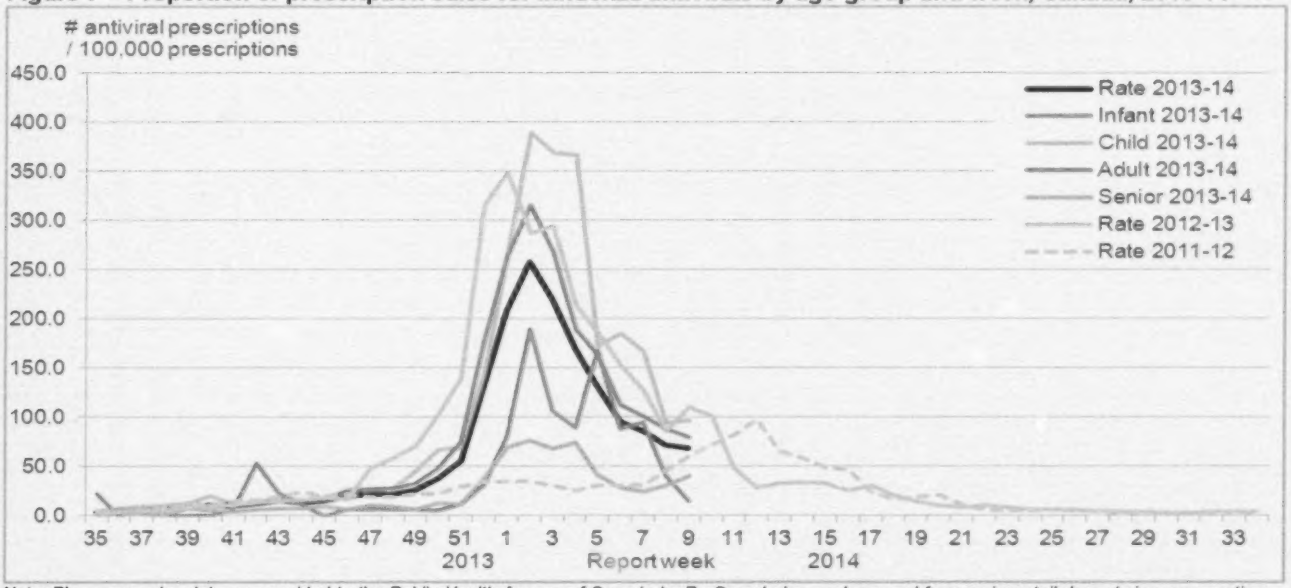


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

In week 09, the proportion of prescriptions for influenza antivirals continued to decrease, with the largest proportion of prescriptions for antivirals continuing to be among children 2-18 years of age and adults 19-64 years of age (Figure 7). Within these age-groups, higher proportions of prescriptions for antivirals were observed among persons between 5 and 45 years of age.

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2013-14



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 09, 18 new laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network, compared to 30 in week 08. In week 09, influenza A was reported in 14 cases and influenza B in four cases. A greater proportion of cases have been reported with influenza B cases in recent weeks, following the trend in laboratory detections (Figure 8a). Although the number of cases is small, a greater proportion of cases with influenza B have been children between 2 and 10 years of age compared to the younger age-groups affected by A(H1N1)pdm09 this season. No ICU admissions or deaths were reported in week 09.

To date this season, a total of 542 influenza-associated paediatric hospitalizations have been reported by the IMPACT network, 92% of which have been influenza A, and almost all of those subtyped (97%) were A(H1N1)pdm09. Children ≥2 years of age represent 55% of cases to date (Table 4). Seventy-nine ICU admissions have been reported, of which 46 (58%) were children ≥2 years of age (Figure 9a). Among the 77 ICU admission for which the influenza type reported, all but four were cases with influenza A, and 96% of those subtyped were A(H1N1)pdm09. Among the 67 ICU cases with available data, 45 (67%) were reported to have underlying medical conditions. No deaths have been reported.

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 09, 21 new laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations reported through active surveillance by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network, compared to 44 in week 08. There has been a steady decline in the number of new cases over recent weeks, and a greater number of cases of influenza B. Among cases in week 09, 14 (66.7%) were influenza A, and seven were influenza B (Figure 8b). All but two hospitalizations occurred among adults ≥45 years of age. Three ICU admissions were reported in week 09, all ≥45 years of age, two with influenza A and one with influenza B. No deaths were reported in week 09.

To date this season, 1104 influenza-associated hospitalizations have been reported by the PCIRN-SOS network, 1036 (93.8%) with influenza A, predominantly A(H1N1)pdm09 (Table 5). ICU admission was required for 192 hospitalizations, all but seven of which were cases with influenza A (107 A(H1N1)pdm09, four A(H3N2) and 74 A(unsubtyped)). More than three quarters of hospitalizations and approximately 80% of ICU admissions were ≥45 years of age. Of the 156 ICU admissions with available information, 137 (87.8%) were reported to have at least one comorbidity and of the 165 ICU admissions with available information 119 (72.1%) reported not having been vaccinated this season. Fifty-three deaths have been reported, all but two with influenza A (32 A(H1N1)pdm09, two A(H3N2) and 17 A(unsubtyped)); five cases 20-44 years of age, 26 cases 45-64 years of age and 22 cases ≥65 years of age (Figure 9b).

Note: PCIRN-SOS conducted passive surveillance from April 30th to November 14th, 2013. Cases reported during this period were identified by laboratory detection of influenza among patients admitted to participating hospitals. Active surveillance began November 15th during which time PCIRN site coordinators investigate cases potentially related to influenza. Data from both active and passive surveillance reported during the 2013-14 season are included in this report. The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2013-14

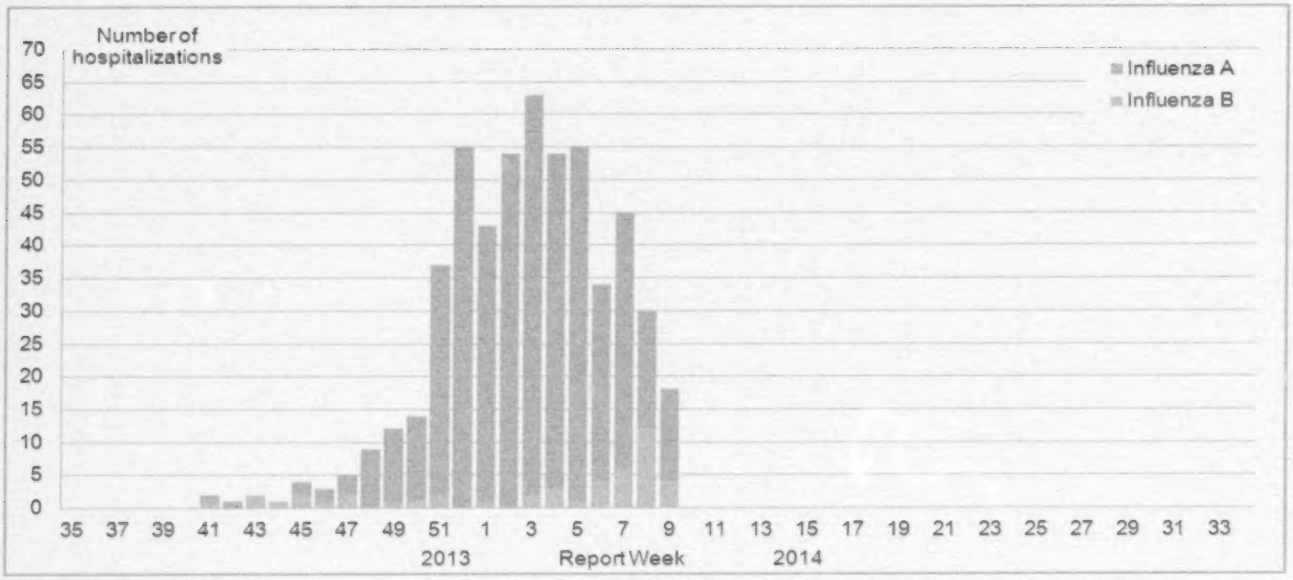
Age groups	Cumulative (25 Aug. 2013 to 1 Mar. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-5m	96	28	0	68	2	98 (18%)
6-23m	142	39	1	102	5	147 (27%)
2-4y	148	47	2	99	15	163 (30%)
5-9y	75	22	1	52	20	95 (18%)
10-16y	35	13	0	22	4	39 (7%)
Total	496	149	4	343	46	542
% [1]	91.5%	30.0%	0.8%	69.2%	8.5%	100.0%

Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2013-14

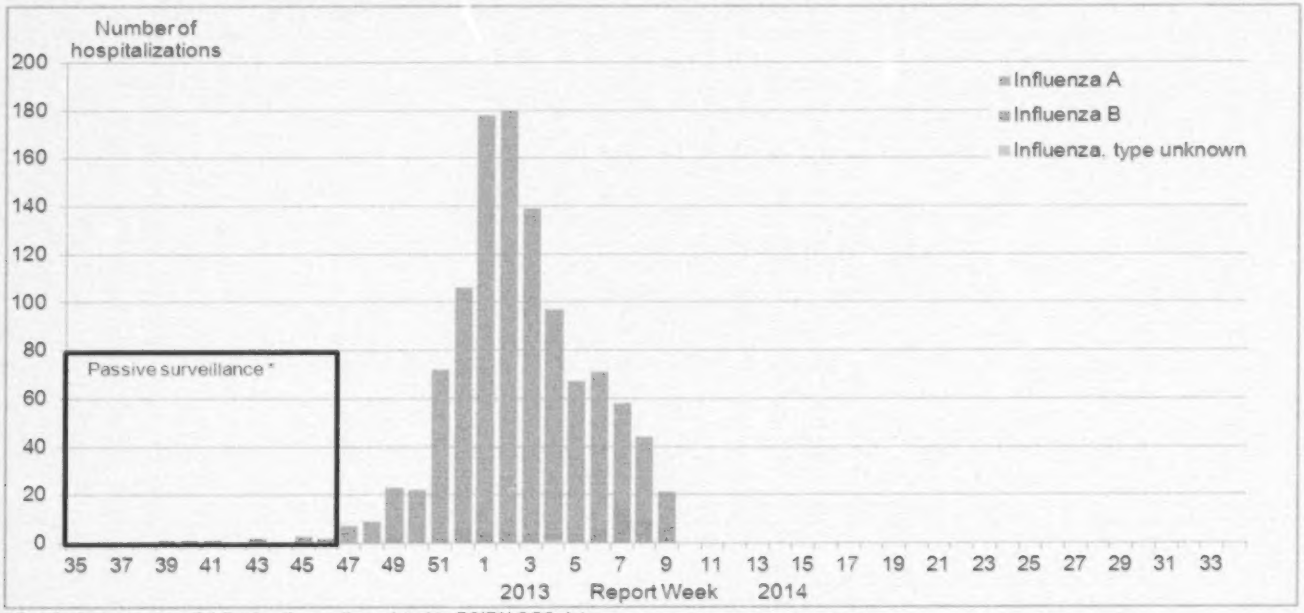
Age groups (years)	Cumulative (25 Aug. 2013 to 1 Mar. 2014) *					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A(UnS)	Total	# (%)
16-20	13	3	0	10	1	14 (1%)
20-44	225	123	4	98	4	229 (21%)
45-64	411	191	4	216	13	424 (39%)
65+	384	189	29	166	49	433 (39%)
Total	1033	506	37	490	67	1100
% [1]	94%	49%	4%	47%	6%	100%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available. * One case for which the influenza type has not yet been reported, and three cases for which the age-group was not reported, are not included in Table 5.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2013-14
A) Paediatric hospitalizations (≤16 years of age, IMPACT)



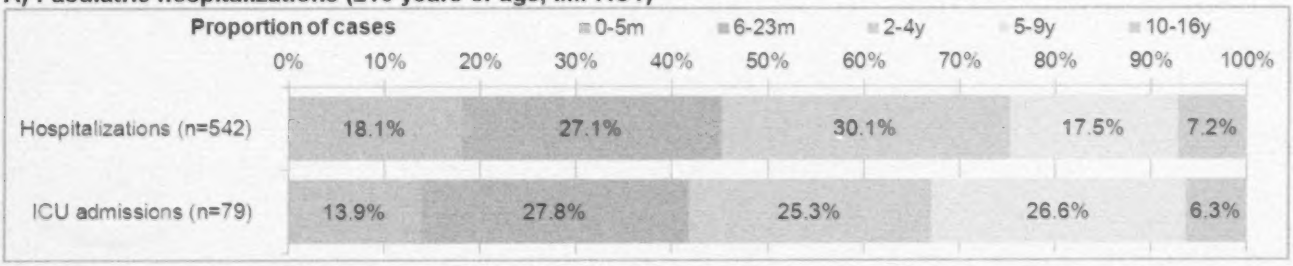
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



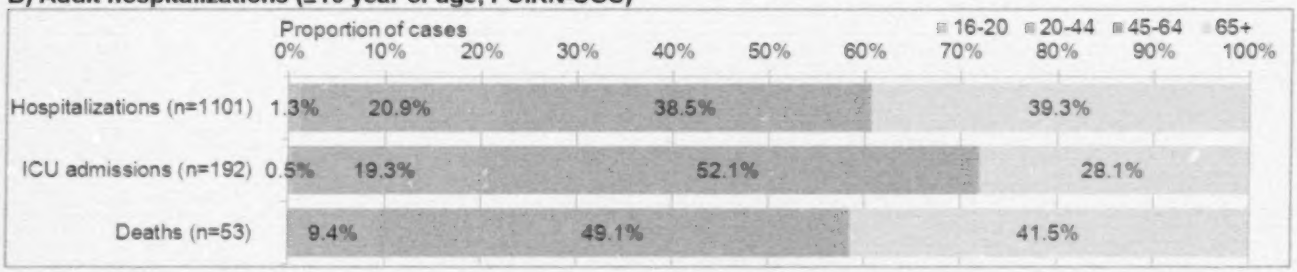
* See footnote on page 6 following the section related to PCIRN-SOS data.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2013-14

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 09, 134 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories.* The majority were cases of influenza A (101, 75.4%), of which 57 (56.4%) were A(H1N1)pdm09, four (4.0%) was A(H3N2), and 40 (39.6%) were A(unsubtyped). The proportion of cases with influenza B has been increasing in recent weeks. Six ICU admissions were reported in week 09, all with influenza A: three adults 45-64 years of age, one ≥65 years of age, and two with age not reported. Nine deaths were reported, two thirds of which were adults 65 years of age and older. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total.

To date this season, 3,238 influenza-associated hospitalizations have been reported, 95.9% with influenza A. The majority (57.6%) of hospitalizations have been cases 45 years of age of older (Table 6). A total of 307 ICU admissions have been reported this season, of which 67.1% were among adults 20-64 years of age. A total of 182 deaths have been reported. The highest proportion of deaths has been among adults 20-64 years of age (51.1%), followed by adults ≥65 years of age (39.6%). Influenza B has been detected infrequently among severe cases of influenza to date this season: in only 4.1% of hospitalizations, 1.0% of ICU admissions, and 4.4 % of deaths. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, QC, and NB. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2013-14

Age groups (years)	Cumulative (25 Aug. 2013 to 1 Mar. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	530	261	6	263	22	552 (17%)
5-14	116	60	5	51	15	131 (4%)
15-19	32	19	2	11	1	33 (1%)
20-44	543	391	3	149	9	552 (17%)
45-64	999	652	17	330	24	1023 (32%)
65+	784	422	50	312	58	842 (26%)
Unknown	101	79	3	19	4	105 (3%)
Total	3105	1884	86	1135	133	3238
Percentage[1]	95.9%	60.7%	2.8%	36.6%	4.1%	100%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2013-14 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): Eight new cases of human infection with influenza A(H7N9) have been reported by the World Health Organization since the last FluWatch report. Globally to March 6, 2014, the WHO has been informed of a total of 380 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 116 deaths.

PHAC – Avian influenza A(H7N9)

WHO – Avian Influenza A(H7N9)

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Two new laboratory-confirmed cases of MERS-CoV, with one resulting in death, have been reported by the World Health Organization since the last FluWatch report. Globally, from September 2012 to date, the WHO has been informed of a total of 186 laboratory-confirmed cases of infection with MERS-CoV, including 81 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East.

PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)

WHO – Coronavirus infections

International Influenza Reports

World Health Organization influenza update

World Health Organization FluNet

WHO Influenza at the human-animal interface

Centers for Disease Control and Prevention seasonal influenza report

EuroFlu weekly electronic bulletin

European Centre for Disease Prevention and Control - epidemiological data

South Africa Influenza surveillance report

New Zealand Public Health Surveillance

Australia Influenza Report

Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2013-2014 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

- **Schools:** Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.
- **Hospitals and residential institutions:** two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.
- **Workplace:** Greater than 10% absenteeism on any day which is most likely due to ILI.
- **Other settings:** two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

* More than just sporadic as determined by the provincial/territorial epidemiologist.

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.